Fire Weather Annual Summary - 2004

For **Eastern Washington And Northern Idaho**



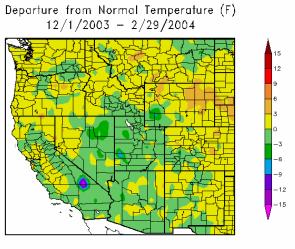
Bob Tobin - Fire Weather Program Manager

Review of the 2004 Seasonal Weather

Winter 2003-2004

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Late September and October of 2003 remained very warm and dry. Temperatures through the middle of October were well above normal and precipitation was below normal. That came to an end at the last 10 days of the month. A very wet weather system moved into the region on the 20th dropping ample amounts of precipitation across the region. This was followed by a dry cold front the last week of the month. With the exception of the wet storm the month of October was extremely dry. This was followed by a rapid cool down, which resulted in the 100 and 1000 hour fuels going into the cool winter season very dry.



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After a very cold and snowy November, it was certainly looking like a cool, wet good winter was in store. However, temperatures warmed to above normal through the month of December. Periodic storms kept moving through the area during the first half of the month bringing most of the precipitation for December. The weather dried out somewhat for the second half of the month. Precipitation was a mixture a mixture of rain and snow for the lower elevations, but in the mountains nearly all the precipitation was snow, resulting in a good start on the mountain snow pack. A

strong cold front after Christmas didn't bring much in the way of precipitation but temperatures were significantly cooler, with sub-freezing highs to end the month.

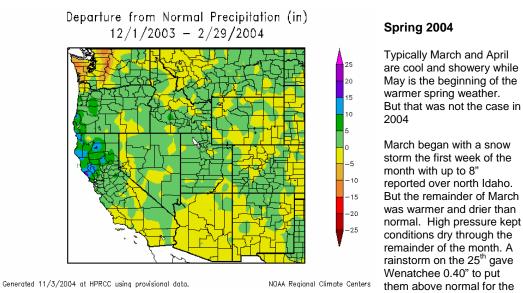
The New Year started off with a strong storm system moving through the Pacific Northwest. Storm totals of 4-8" were common. Behind this storm came the coldest arctic air mass since February 1996. Temperatures dropped well below zero on the 4th and remained cold for the next few days. The coldest reported temperatures included: -34F at Turnbull Wildlife Refuge, -32F at Springdale, -28F at Deer Park, -25F at Davenport, and -24F at Coeur d'Alene airport.

Warm southwesterly flow rode over the arctic air providing nearly continuous light snow and warming temperatures from the 6th through the 8th. A large ridge of high pressure during the middle of the month kept the region dry and temperatures near or above normal. Another strong storm moved through the region the 23rd and 24th. This resulted in the deepest snow pack of the year for the Spokane area. This was short-lived, however as warm southwesterly flow developed. Daytime temperatures warmed into the 40s and lower 50s with above-freezing temperatures at night. A cold front moved through the region on the 30th. Wind gusts to 60 mph were measured on the Palouse. A gust to 52 mph was felt at Wenatchee while the winds at Spokane reach 49 mph.

February had a cold start with temperatures during the first half of the month more typical of early January. But warmer and wetter weather found its way into our area by the middle of the month. Temperatures warmed to above normal values with highs reaching the 50s and low 60s during the last few days of the month. For most of the region February turned out to be near-normal for both

temperatures and precipitation. A wet weather system on the 25th brought a good amount of precipitation to the east slopes of the Cascades. Wenatchee received 0.67" of rain and wet snow which put them well-above the normal precipitation for the month.

For the three month period temperatures were mainly below normal across the region. The exception was southeast Washington and the southern Idaho Panhandle where temperatures were slightly above normal. Precipitation was normal to well above normal...except for the east slopes of the Cascades where precipitation was below normal.



month, but most locations in the region saw below normal precipitation for March.

Showers and thunderstorms were few and far between with temperatures well above normal in April. High temperatures reached 80 degrees for the first time in 2004 in Lewiston on April 12th, about 2 weeks ahead of normal. This was followed by a cool, showery spell for the middle month. The region picked up most of its precipitation during this week. While some locations reported normal rainfall for April, most sites did not. By the end of the month, much of the area was significantly below normal for the total precipitation for the water year. While snow pack at the end of January was 85-100% of normal, by the end of April snow pack across the region had dropped to 60-70% of normal. This was the result of above normal temperatures and

May began warm and dry. Temperatures were in the 70s and lower 80s for the first few days of the month. The persistent western U.S. high pressure ridge moved off the coast and allowed storms to drop down from Canada. These storms coupled with a moist atmosphere already in place combined to give the Inland Northwest very active weather. Heavy rain showers became the rule and brought much-needed rain to the area. At first the storm track was primarily across the southern Washington and the southern Idaho Panhandle. But eventually the entire region reported good rainfall. This wet episode culminated on the 19th-21st of the month. A tornado touched down briefly near East Wenatchee on the afternoon of the 19th. Heavy rain and large hail was also observed with this storm. On the 20th, 1" hail fell on the Waterville Plateau and 3/4" hail was recorded at Potholes Reservoir near Moses Lake. Another tornado occurred on the 21st, this time just west of Spokane. Very heavy rain and 3/4"-1" hail was also reported. Spokane Airport picked up 2.19" in 24 hours. This was only 0.03" shy of the all-time record dating back to 1888.

Departure from Normal Precipitation (in) 3/1/2004 - 5/31/2004

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Preliminary monthly totals are also impressive:

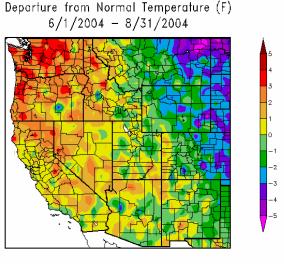
	May 2004	Rank	All-Time May record
Wenatchee	1.29"	7 th	2.02" in 1998
Chief Joseph Dam	1.28"	12 th	2.60" in 1990
Omak	1.85"	8 th	4.42" in 1948
Lewiston	3.13"	7 th	3.78" in 1998
Newport	3.22"	13 th	5.73" in 1984
Avery, ID	6.85"	1 st	5.53" in 1998
Cabinet, ID	3.29	11 th	6.56" in 1998
Kellogg	5.35	4 th	5.93" in 1941
St. Maries	4.60"	5 th	6.48" in 1948
Sandpoint	4.31"	8 th	6.13" in 1941
Spokane	3.67"	3 rd	5.71" in 1948

In the Inland Northwest, May can be a wet month. In fact, while the winter months of December and January are often the wettest of the year, in most of the locations in this area May is wetter than March and April. On average May is actually the wettest of all of the months in Lewiston. Temperatures for the three month period were 2-3 degrees above average.

Summer 2004

The first half of June was mainly cool and showery. Nearly all of the first 15 days saw below normal temperatures, with most of the precipitation for the month falling in the first 2 weeks. But the weather pattern changed mid-June and the area was dominated by high pressure for the remainder of the month. Temperatures soared into the 90s with Lewiston reaching the century mark on the $23^{\rm rd}$, two weeks ahead of normal. The $25^{\rm th}$ was an active weather day. Very wet thunderstorms caused flash flooding in Republic, along with hailstones nearly 2" in diameter. Just a few hours later a tornado touched down near Priest Lake. These thunderstorms were responsible for igniting numerous wildfires across the east slopes of the Cascades.

This hot weather pattern persisted throughout July. Aside from a brief cool down during the 2nd week of the month, every day in July was warmer than normal. 90s were commonplace, with Lewiston reaching triple digits 5 times. Thunderstorms on the 18th and 19th brought most of the rainfall to the area. Meanwhile wildfires in the Cascades kept the skies smoky for residents along the east slopes.



After a few more hot days to start off the month of August, a very cool Pacific weather system moved into the area. Temperatures dropped about 25 degrees, with Wenatchee and Spokane unable to even reach 70 on the 6th. Spokane also picked up an inch of rain from wet thunderstorms on that day, while Wenatchee had a 3day total of 0.39". While this cool spell was welcome relief for firefighters, it was shortlived. Only 3 days later temperatures were once again above normal and would remain so for the next 2 weeks. In fact, this period saw some of the hottest weather of the summer. Wenatchee hit 101 on the 13th for its only triple

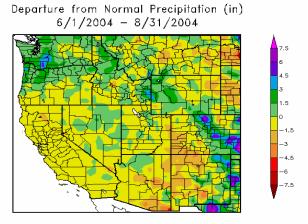
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digit day of the summer and temperatures remained in the 90s for 12 consecutive days. Spokane's mercury reached 97 two days in a row with low temperatures barely making it below 70 at night. Once again, very wet thunderstorms affected the northeast mountains and Idaho Panhandle at times. Colville was the recipient of one such storm on the 18th, with 1.90" of rain falling in just a few hours.

The second weather system that moved through the region was anything but quick. Temperatures dropped into the 60s and lower 70s on August 22^{nd} as three Pacific storms moved through the area. To give an idea of the rarity of this pattern, Spokane remained below 70 for 5 consecutive days. Only 2 other Augusts (dating back to 1881) had there been longer cool spells than this. Also, measurable rain fell in Spokane on those 5 consecutive days, second only to August of 1903 which saw 6 rainy days in a row. The rain and cool weather was a welcome relief as most of the major fires along the Cascades were contained.

One of the more interesting weather events during the summer was the wind and dust storm on the evening of August 2nd. After a month of dry hot weather, conditions were favorable dust storms. Most such storms in this area are more prevalent in the fall when Pacific storms generate sufficient dry winds to result in fire management problems. But on August 2nd, the source of the wind was a large thunderstorm near Lewiston. The strong gust front that was generated by the thunderstorm traveled north across the Palouse, gathering dust along the way. When it reached the Spokane metro area, visibilities were reduced to less than a mile as the winds gusted to over 50 mph.



Overall the summer of 2004 was a warm one. If not for the cool spell at the end of August, it might have gone down in the books as downright hot. Spokane had 25 days of 90 or better, well above the normal of 18, but short of last year's 33 days. Wenatchee had 41 days of 90 or hotter, compared to a normal of 29 days. Meanwhile, Lewiston exactly matched its normal of 44 days. One of the more interesting indicators of the summer was actually in the minimum temperatures.

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MOAA Regional Climate Canters

Three factors will typically keep overnight temperatures warm: wind, clouds, and humidity. The Wenatchee airport is typically mild during summer nights due to the persistent northwest wind that blows on most nights. But the warm nights this summer was more than normal. In fact, the average low temperature for the summer months at Wenatchee of 61.6 was the warmest on record (since 1959). On average Wenatchee only has 3 nights above 70, but this summer saw 11 such nights. Spokane Airport typically cools down into the 50s at night, with an average of 16 nights of 60 or warmer. But this year the mercury remained above 60 for 38 nights, which was second only to the very hot summer of 1958 (47 nights above 60).

While there were some cloudy nights, the main contributor to the warm nights this summer was humidity. The weather pattern for much of the summer allowed large amounts of subtropical moisture from the desert southwest to move northward into our area (Psuedo-Monsoon). This also contributed to a very active thunderstorm season this year.

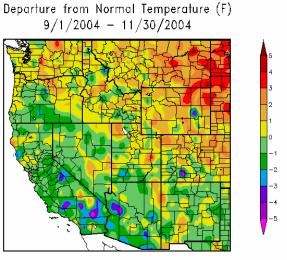
For the tree month period temperatures averaged about 3 degrees above normal. Precipitation varied from slightly below normal along the east slopes of the Cascades to above normal across the northeast mountains and the Idaho Panhandle.

Fall 2004

After a rather warm summer, the Inland Northwest was treated to a cool September. Typically there will be a few days in the 90s during the first week of September. But this year temperatures struggled to reach 80 in the north and mid 80s south. Overall the month was on the dry side. A few fronts in the middle of the month brought the total rainfall for September. High pressure built into the region the last week of the month for dry conditions and temperatures in the 70s and lower 80s.

While September was on the cool side, it remained well above the freezing mark. In fact, Spokane didn't see freezing temperatures until the last week of October and Lewiston remained above 32 until the 1st of November, well beyond the normal end of the growing season.

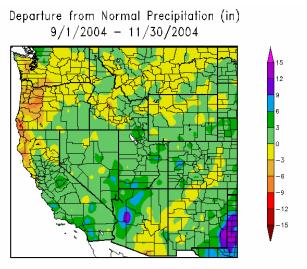
The first half of October was warmer than normal, with temperatures remaining in the 70s and even the lower 80s. A rainy front in the middle of the month moved through the region for cooler temperatures. Most sites picked up about a half inch of rain as temperatures dropped into the 40s and 50s.



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A strong ridge of high pressure dominated the area for the first 2 weeks of November, bringing extensive fog and low clouds to the region. This weather pattern isn't unusual for the middle of winter, but it is a bit atypical for early November. The high pressure moved west a bit and took up residence offshore for the remainder of the month. This allowed a few weak storms to move into the Inland Northwest, bringing with them only light amounts of rain. Spokane received its first inch of snow on the last day of November, nearly 3 weeks late. Overall, November was very dry.

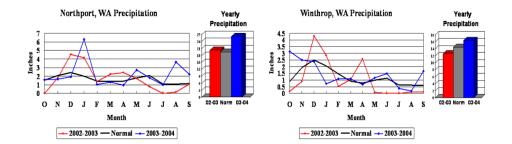
The 0.08" at the Wenatchee Airport was the 3^{rd} driest November since 1959. At Wenatchee Water Plant, only 0.15" fell, which was the 3^{rd} driest November since 1931.

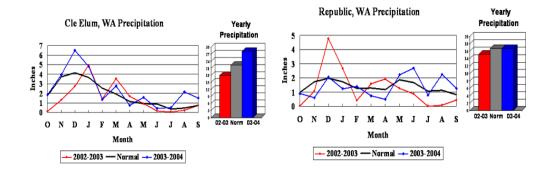


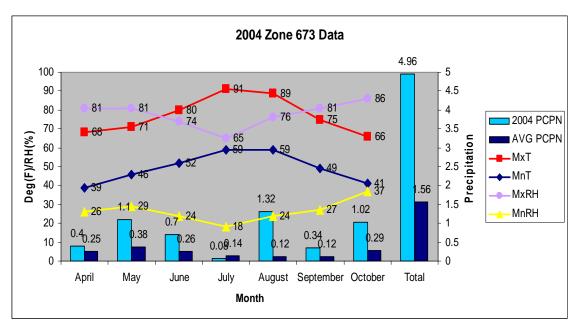
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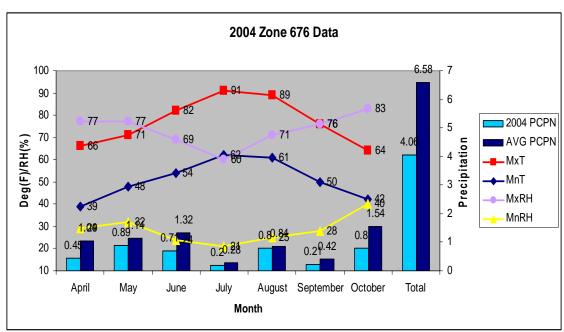
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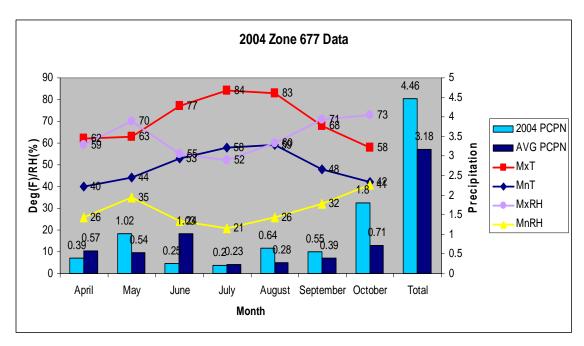
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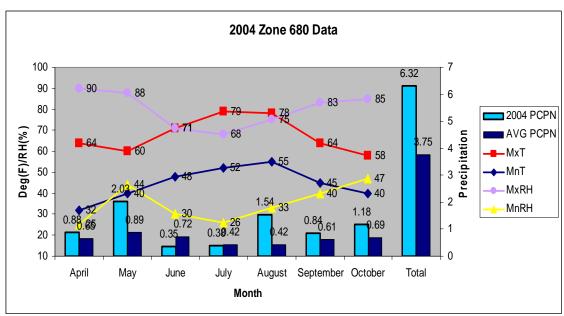


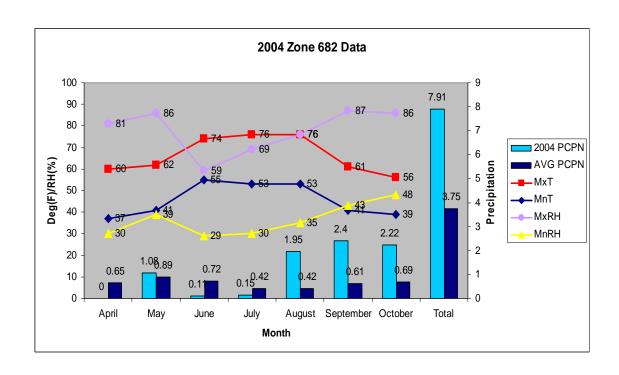


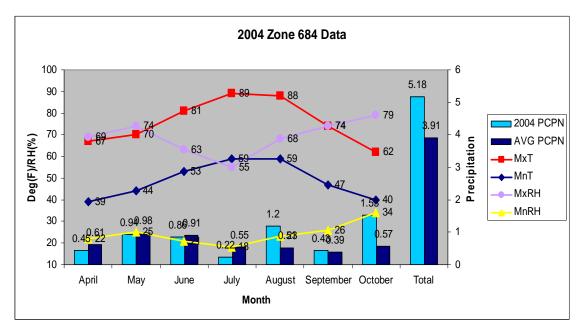


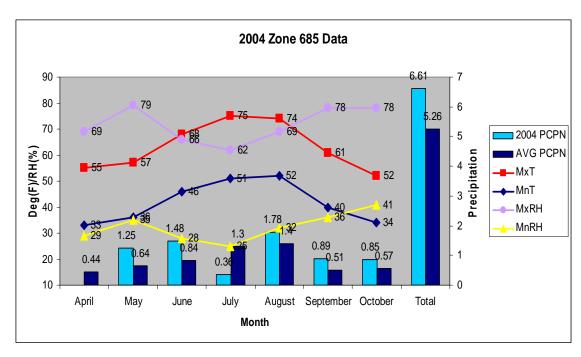


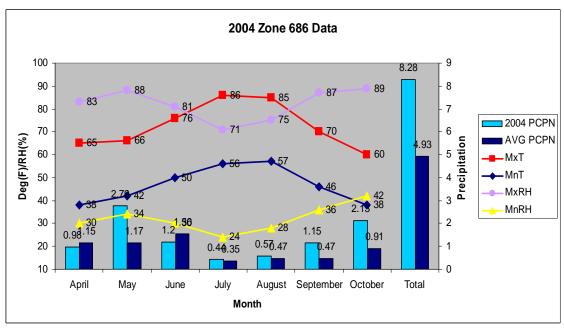


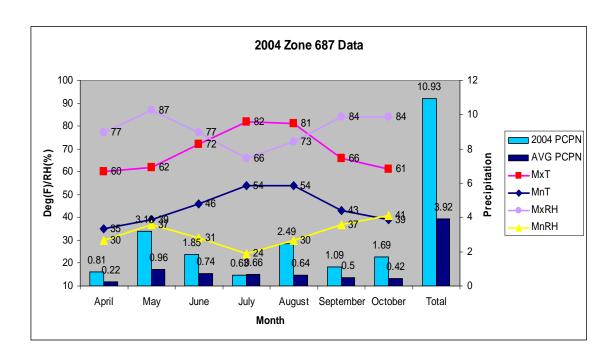


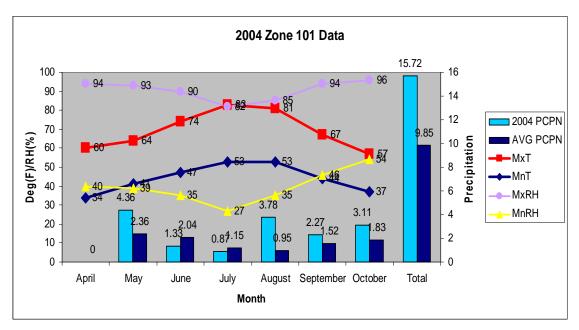












Spokane 2004 Red Flag Warnings/Watches

Date	Zones	Reason	Large Fire Potential	Verification
July 13	673, 676, 677	Dry lightning	C1, E3 High E1, E2 Mod	Yes – 673, 676, 677 Not preceded with a watch
July 16	676,677,68 0, 682	Dry Ltg	High	Watch - Cancelled
July 26	684	Wind/Low RH	High	Yes – 684 Not preceded with a watch
Aug 2-3	673, 686,101	Dry lightning	High	Yes – 673, 687 Not preceded with a watch
Aug 14- 15	673, 676, 677, 680, 682, 684, 685	Dry lightning	E3 High E1, C1 Mod	Yes – 685 No – 673, 676, 677, 680, 682, 684 (no lightning strikes observed) Preceded with a watch
Aug 14- 15	686, 687,101	Dry lightning	E2 Mod	No – 686, 687 (no lightning strikes observed) Preceded with a watch
Sept 30	684	Wind/ Low RH	Low	Yes – 684 Preceded with a watch
July 13	684	Dry lightning	E1, E2 Mod	Missed 684 (lightning strikes, little if any rain, and NFDRS fire danger VH)
August 2	676	Dry lightning	High	Missed 684 (30 lightning strikes, .0308 rain)

Total Warnings: 18 Dry Lightning: 16 Wind/low RH/Haines: 2 Correct Warnings: 8 Incorrect Warnings: 10 Missed Warnings: 2

Warnings Preceded with a Watch: 11 of 18 or 61%

Probability of Detection: Dry Lightning . 75 Wind/low RH/Haines 1.00 All . 80

False Alarm Rate: Dry Lightning . 63 Wind/low RH/Haines . 00 All . 56

Critical Success Index: Dry Lightning . 33 Wind/low RH/Haines 1. 00 All . 40

All Warnings

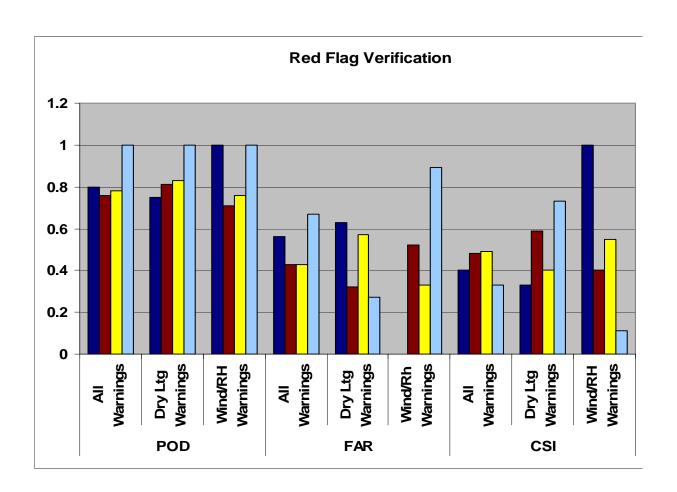
All RFW by Month	JUN	JUL	AUG	SEP	OCT	Season
Warnings	0	4	13	1	0	18
Warned Events	0	4	3	1	0	8
Unverified Warnings	0	0	10	0	0	10
Missed Events	0	1	1	0	0	2
Total Events	0	5	4	1	0	10
POD	0	0.80	0.75	1.00	0	0.80
FAR	0	0.00	0.77	0.00	0	0.56
CSI	0	0.80	0.21	1.00	0	0.40

Warnings for Dry Lightning

RFW for Dry Lightning	673	676	677	680	682	684	685	686	687	101	All Zones
Warnings	3	2	2	1	1	1	1	2	1	2	16
Verified Warnings	2	1	1	0	0	0	0	1	0	1	6
Unverified Warnings	1	1	1	1	1	1	1	1	1	1	10
Missed Events	0	1	0	0	0	1	0	0	0	0	2
Total Events	2	2	1	0	0	1	0	1	0	1	8
Lead Time (hours)	10	8	16	0	0	0	0	8	0	5	8
POD	1.00	.50	1.00	0.00	0.00	07	0.00	1.00	.00	1.00	0.75
FAR	0.33	0.50	0.50	1.00	1.00	1.00	1.00	0.50	1.00	0.5	0.63
CSI	.67	0.33	0.50	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.33

Warnings for Low RH Combined with Wind or Haines

RFW with Low RH	673	676	677	680	682	684	685	686	687	101	All Zones
Warnings	0	0	0	0	0	2	0	0	0	0	2
Verified Warnings	0	0	0	0	0	2	0	0	0	0	2
Unverified Warnings	0	0	0	0	0	0	0	0	0	0	0
Missed Events	0	0	0	0	0	0	0	0	0	0	0
Total Events	0	0	0	0	0	2	0	0	0	0	2
Lead Time (hours)	0	0	0	0	0	8	0	0	0	0	8
POD	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
FAR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CSI	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00



2004 Fire Season Fire Activity Summary

The total number of fires in eastern Washington and north Idaho in 2004 was above the long term average and the number of lightning caused fires was also above the long term average. While the total acres burned was well below the long term average.

Below is a list of all fires over 100 acres listed in chronological order.

August 16

June 3	-	Rye Grass Coulee Fire, 888 acres, SPD
June 24	-	Freezeout Fire, 838 acres, OWF
June 26	-	Hopkins Canyon Fire, 5072 acres, COA
June 26	-	Pot Peak/SiSi Ridge/Deep Harbor Fire, 47,470 acres,
June 30	-	North Omak Lake Fire, 138 acres, COA
June 30	-	Duley Lake Fire, 352 acres, COA
July 15	-	Icicle Fire, 118 acres, OWF
July 18	-	Rattlesnake WFU, 775 acres, OWF
July 25	-	Lauderdale Fire, 250 acres, SES
July 29	-	Elmer City Fire, 1929 acres, COA
July 30	-	Elk Heights Fire, 358 acres, SES
August 1	-	Mill Canyon Fire, 1191 acres, NES
August 3	-	Billy Springs Fire, 170 acres, COA
August 5	-	Mebee Fire, 238 acres, OWF
August 5	-	Dirty Face Fire, 295 acres, OWF
August 8	-	Fischer Fire, 16,439 acres, OWF
August 9	-	Mud Lake Fire, 4000 acres, SES
August 16	-	Williams Butte Fire, 2095 acres, OWF

Parameter Creek Fire, 157 acres, COA

Fire Data of User Agencies - 2004

Agency	Lightning Caused Fires	Acres Burned	Human Caused Fires	Acres Burned	Total Fires	Total Acres Burned
SE DNR	47	86	111	4987	157	5073
NE DNR	207	620	181	798	388	1418
Colville BIA	108	6192	62	2233	168	8425
Okanogan- Wenatchee NF	176	52,737	43	16,577	219	69,314
Colville NF	71	14	5	2	76	16
Idaho Panhandle	194	66	82	172	366	432
FWS	14	493	5	5	19	498
BLM	3	46	6	1677	9	1723
Total	819	60,254	495	26,451	1314	86,705

Fire Data by Year: 1970-2004

Year	Total Fires	Lightning Caused Fires	Total Acres Burned
1970	1,303	488	215,037
1971	606	127	3,902
1972	747	253	2,111
1973	1,079	123	11,223
1974*	1,103	238	9,466
1975	953	337	4,807
1976	740	117	32,272
1977	983	591	16,342
1978	790	339	2,361
1979	1,263	446	17,090
1980	613	243	3,465
1981	930	482	16,894
1982	910	368	5,776
1983	595	176	2,453
1984	879	406	5,757
1985	1,112	355	71,488
1986	865	295	9,727
1987	1,057	348	18,214
1988	689	84	89,140
1989	1,088	399	14,259
1990	1,203	583	15,324
1991	1,080	430	47,928
1992	959	368	33,819
1993**	655	186	3,295

1994	1,433	648	260,245
1995	792	211	4,002
1996	739	205	35,375
1997	467	247	5,283
1998	969	439	50,943
1999	951	283	13,128
2000***	827	435	259,024
2001	953	507	182,468
2002	1,157	465	70,814
2003	1,027	416	147,130
2004	1,314	819	86,705

<sup>Colville NF not included in years prior to 1974
Spokane IA not included in years prior to 1993
Added Northern Idaho Panhandle District in 2000</sup>

FORECASTS 2004

		itine ecast	Spot	Forecast	Red Fla	ag Events	Zone Trend
Mo.	FW Fests	LM Fcsts	Wildfire PNF	Prescribed Fires	FWX Watch	Red Flag Warning	NFDRS Fests
Jan	0	22	0	0	0	0	0
Feb	0	20	0	11	0	0	0
Mar	0	23	0	30	0	0	0
Apr	50	2	0	163	0	0	0
May	62	0	0	99	0	0	0
Jun	60	0	19	8	0	0	10
Jul	62	0	41	0	4	4	31
Aug	62	0	69	2	11	14	31
Sep	60	0	23	86	1	1	30
Oct	54	0	0	108	0	0	17
Nov	0	30	0	8	0	0	0
Dec	0	31	0	7	0	0	0
Total	350	128	152	522	16	19	119

OPERATIONAL SUMMARY OF THE 2004 FIRE SEASON

Washington and northern Idaho experienced cool, slightly wetter than normal weather through late fall and early winter. From right after Christmas to the third week of January were particularly cool and wet. Mountain snow packs were at or above seasonal normals through the middle of February. However, from mid February through April conditions were much warmer and drier than normal. This resulted in below normal snow pack entering spring. Fuels were able to cure as much as three to four weeks ahead of normal. Weather conditions turned cool and wet across much of the forecast district in May and June. The Idaho Panhandle and northeast mountains reported above to much above normal precipitation. The east slopes of the Washington Cascades missed most of not all of the spring rains. July and August were warmer and drier than normal along the cascades. However a series of mainly wet thunderstorms kept fuels above critical levels for most of northeast Washington and the Idaho Panhandle. An extremely wet weather system brought and early end to the fire season for all locations at the end of August.

Winter land management forecasts were issued once a day five days a week through the winter and early spring months. Fire weather full service forecast support (forecasts issued twice daily, seven days a week) started April 5th. Full service forecast support continued until October 29th. Land management forecast support commenced on November 1st. Land management forecasts again were issued once a day as a planning guide for land management agencies through the winter months.

This season, WFO Spokane Fire Weather Program issued a total of 674 spot forecasts for management planned activities and wild fires. This spot forecast total is well above the 491 in 2003 and the 603 in 2002.

The Internet spot forecast request system continues to offer land management agencies rapid turn-around for their spot requests. The rapid response time has allowed for more spot forecasts to be processed.

WFO Spokane again hosted a daily internet briefing through the peak fire season. This is an excellent opportunity for the weather forecasters to share their thoughts with the land managers and receive feedback of forecasts.

IMET & Dates Dispatched	Incident Name and Location	Incident Team
Bob Tobin 6/30-7/05/04	Hopkins Canyon Fire	Reed/Halloway
Scott Weisharr/Mark Burger (T) 7/03-7/17/04	Pot Peak Fire	Lohrey-Johnson
Joe Solomon/Coleen Decker (T) 7/17-7/28/04	Icicle Fire	Bennett
Tobin/Andy Haner (T) 7/16- 7/31/04	Pot Peak Fire	Johnson - Lohrey
Jim Prange/Bob Hoenisch (T)/Jennifer Zeltwanger 7/30-	Pot Peak Fire	Lohrey – Jennings/Perry

8/13/04		
Rocco Pelatti 7/30-8/01/04	Elmer City Fire	Reed/Halloway
Rocco Pelatti 8/01-8/04/04	Elk Heights Fire	Johnson/Barnett
Dan Borsum 8/1-14/04	Rattle Snake Peak WFU	Bonefield
Bob Tobin/Coleen Decker 8/10-24/04	Fischer Fire	Anderson
Andy Haner 8/12-08/20/04	Pot Peak Fire	Jennings/Perry
Rocco Pelatti 8/17-8/21/04	Bybee/Williams Butte Fire	West - Lohrey
Bernie Meyer/Seth Nagle (T) 8/20-8/30/04	Pot Peak Fire	Jennings/Perry
Bob Nester 8/20-8/26/04	Williams Butte Fire	Lohrey
Makoto Moore 8/23/-8/28/04	Fischer Fire	Anderson